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(54) IMPROVED FILTERING HOOD

(57) The present disclosure relates to a hood comprising a collecting section (3) with a filtering device (1A) inserted therein, the latter having a panel made of a filtering material (5) placed in a support frame (4), an intake duct (2) with an inlet located above said panel made of the filtering material (5), a gas extractor (6) located in said duct (2), the suction port (8) of said gas extractor (6) facing a portion (5a) of said panel made of the filtering material (5). The hood is characterized in that it comprises a plurality of louvers (10) having a predetermined direction of extension and associated with said support frame (4) to overlap said portion (5a) of the filtering panel, each louver of said plurality of louvers (10) being movable about its own axis (Y-Y) relative to said support frame (4) to pivot between a position in which it is substantially parallel to the surface of the portion (5a) of the filtering panel that faces the suction port (8) of the extractor, and a position in which it is transverse to said surface of said portion (5a) of the filtering panel (5).

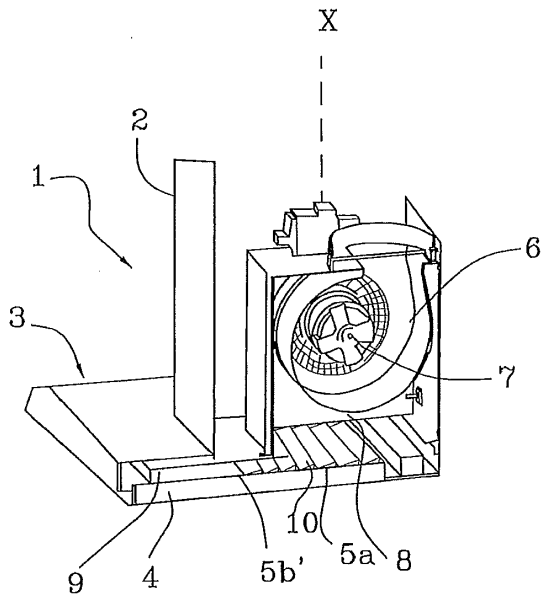

FIG 5

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Description

Field of the Invention

[0001] The present invention relates to an improved filter hood as defined in the preamble of claim 1.

[0002] Particularly, the present invention relates to a hood for extraction and filtration of gases from home kitchens.

Background art

[0003] Domestic hoods are traditionally known as extractor or filter hoods depending on whether they exhaust air outside of the room in which the hood is installed, using an appropriate extractor or an electrically powered motor fan unit, or recirculate air into the same room, once polluting substances have been filtered out.

[0004] Typically, most of currently manufactured hoods can accomplish either function according to the state assigned to a switch device, which can be selectively actuated by the user or installer of the hood.

[0005] Concerning the filter function, prior art hoods are normally equipped with grease filters and, if they are mounted in a filtering configuration, with activated carbon filters. The former are specially designed to separate the liquid or solid particles suspended in the gases collected by the hood. The latter filter polluting gases or fumes out of the collected gases.

[0006] In terms of construction, these filters are usually arranged on the intake duct of the extractor. Also, they are mounted in series-arrangement for gases to be intercepted first by the grease filter and then by the activated carbon filter.

[0007] The use of such traditional filter arrangement generates turbulence and vortexes in gas flow, which are of great disturbance to the fluid-dynamic operation of the extractor. This causes both energy dissipation in the gas flow and perturbation of the state in which the gas flow enters the filter surface. Due to this perturbation, certain parts of the working surface of the filter have to deal with a larger amount of gases, and other parts of the filter deal with a weaker gas flow.

[0008] This uncontrolled fluid dynamics is unfavorable for a number of reasons including: generally reduced energy efficiency of the hood; high level of sound emissions during operation of the hood; uneven filtering conditions, which both affect filtration efficiency and cause irregular and uneven exhaustion of the activated carbons contained in the filter; low collection of fumes from the cooltop.

[0009] These drawbacks are aggravated in so-called T-shaped hoods. In such T-shaped hoods, the extractor is laterally displaced relative to the filters, due to the off-center position of the intake duct that accommodates the extractor.

[0010] This construction arrangement aggravates the problem of uneven distribution of gas extraction rate on the filters, a higher rate being found in the portion of the filter that directly faces the suction port of the extractor, and a lower extraction rate being found in the adjacent portion of the filter.

[0011] US 6,235,090 discloses a hood having a filter and louvers overlapping the entire surface of the filter. These louvers are maintained in position by the passage of gases until the hood needs cleaning. Therefore, the louvers are movable, but their use generates turbulence and vortexes in gas flow, which are of great disturbance to the fluid-dynamic operation of the extractor. Due to this perturbation, certain parts of the working surface of the filter have to deal with a larger amount of gases, and other parts of the filter deal with a weaker gas flow.

Object of the Invention

[0012] In view of the prior art as set forth hereinbefore, the object of the present invention is to obviate the above drawbacks by providing a hood and a filtering panel for hoods, designed for improving the use of filters regardless of the extraction rate of the extractor.

[0013] This object is fulfilled by a filter hood as defined by the features of claim 1.

[0014] The present invention provides a hood that can establish well-defined and controlled fluid-dynamic conditions in gases, to considerably improve all the characteristic functional performances of the hood.

[0015] The present invention also affords increased filtration efficiency, due to improved, even utilization of the filter surface.

[0016] Furthermore, the present invention ensures improved fume collection over the entire cooktop.

Brief Description of the Drawings

[0017] The characteristics and advantages of the invention will appear from the following detailed description of one preferred embodiment, which is illustrated without limitation in the annexed drawings, in which:

- Figure 1 shows an external perspective view of a hood of the invention;
- Figure 2 shows a bottom perspective view of the hood of the previous figure;
- Figure 3 shows a schematic, partially sectional perspective view of the hood of the invention, with the filtering panel configuration assumed when the extractor is stopped or operates at a low extraction rate;
- Figure 4 shows a perspective view of the filtering panel of the invention, in the configuration of Figure 3;
- Figure 5 shows a schematic, partially sectional perspective view of the hood of the invention, with the filtering panel configuration assumed when the extractor operates at a medium extraction rate;
- Figure 6 shows a perspective view of the filtering panel of the invention, in the configuration of Figure

5;

- Figures 7A and 7B show perspective and lateral views of an element of the filtering panel respectively;
- Figure 8 shows a perspective view of the filtering device with the extractor operating at a medium extraction rate, according to the present invention.

DETALIED DESCRIPTION

[0018] Referring to the accompanying figures, numeral 1 designates a filter hood for use in home kitchens, which comprises an extraction channel 2 extending in a direction of extension X-X and a collecting section 3.

[0019] Particularly referring to Figure 2, the hood 1 comprises a filtering device 1A inserted in the collecting section 3.

[0020] The filtering device 1A comprises a filtering panel (briefly referred to hereinafter as filter) 5 and a support frame 4 in which it is inserted or contained, as is known in the art. The filter 5 comprises a grid, or a grid and an activated carbon panel or, instead of the activated carbon panel, a polyurethane panel, the latter as defined by the features as set forth in PCT/EP2014/055334.

[0021] Preferably, in the filter 5 the grid overlaps the activated carbon panel, or the polyurethane panel.

[0022] Also, these elements are mounted in series-arrangement for gases to be intercepted first by the grease filter and then by the activated carbon filter, if any, or by the polyurethane panel.

[0023] The hood 1 comprises an extractor 6, having an electric motor 7, which is located within the extraction channel 2.

[0024] The hood 1 as shown in the figures has a configuration that is known by hood manufacturers as T-shaped configuration.

[0025] As a result of the T shape of the hood, the suction port 8 of the extractor 6 is placed in front to a portion 5a of the filter 5 and its respective support frame 4, the remaining portion 5b of the panel being reached by the suction of the extractor 6 through a special channel arrangement 9.

[0026] According to the present disclosure, the portion of the frame 4 that directly faces the inlet 8 of the extractor 6 comprises a plurality of louvers 10 having a mainly longitudinal extension, which overlap the portion 5a of the filter 5.

[0027] In one aspect, the support frame 4 for the filtering device 1A is designed as a quadrangle, and comprises two parallel and opposed pairs of sides 4A and 4B, with the plurality of louvers 10 extending across one pair of said sides.

[0028] In the particular view of Figure 8, the plurality of louvers 10 extend between the pair of sides 4B.

[0029] Each louver 10 of said plurality of louvers is mounted to freely pivot about its respective pivot (or rotation) axis Y-Y.

[0030] This axis Y-Y is preferably parallel to the longitudinal extent of the louver, between the opposed sides of the frame 4.

[0031] Preferably, the axis Y-Y about which each louver 10 pivots is located near one of the longitudinal edges of the louver, the other edge being spaced from the former to such an extent as to interfere with the adjacent louver.

[0032] The louver 10 is free to pivot between a position in which it is substantially parallel to the surface of the portion 5a of the filter 5 that faces the suction port 8 (Figures 3 and 4) and a position in which it is transverse to such surface, as schematically shown in Figures 5 and 6.

[0033] Referring to Figure 8, it shall be noted that the freely pivoting louvers 10 change their position in response to the suction generated by the extractor 6 and their inclined position is a function of the amount of such suction.

[0034] Preferably, the position in which each louver 10 is transverse to the surface of the portion 5a of the filter 5 may range from 0° to 80°, preferably from 0° to 75°, which means that it may be from substantially parallel to substantially perpendicular to the surface of the portion 5a of the filter 5.

[0035] In other words, each louver 10 rotates from 0° to 80° about its axis Y-Y.

[0036] Therefore, the portion 5a of the panel of filtering material will be substantially covered by the plurality of louvers 10, as schematically shown in Figure 3, when the extractor 6 exerts no or very little suction and, as shown in Figure 5, the same portion of the filtering panel will be increasingly exposed, as suction increases.

[0037] This behavior will result in a substantially even distribution of airflow extraction rate over the surface of the filtering panel 5, and will prevent the drawback of partial or local use the filtering panel 5.

[0038] In one aspect, when the plurality of louvers 10 are in the position in which they are substantially parallel to the surface of the portion 5a of the filtering panel facing the suction port 8 of the extractor 6, they cover from 30% to 75% of the area defined by the support frame 4.

[0039] It shall be noted, also referring to Figure 7A, that each louver 10 comprises a pair 10A of pivots at the ends of its mainly longitudinal direction of extension, which engage the frame 4 in such a manner as to allow the louvers 10 to pivot relative the support frame 4 under the action of the extractor 6.

[0040] Preferably, according to the present disclosure and referring to Figure 7B, the extent S of the louvers 10 in the direction transverse to the axis Y-Y has a value that increases from the pivoting louver 10 located at the edge 5c of the portion 5a of the filtering panel facing the suction port 8 of the extractor.

[0041] Alternatively, the louvers have the same extents S in the direction transverse to the axis Y-Y, as shown in Figure 8.

[0042] In one aspect, according to the present disclosure and referring to Figure 7B, each louver 10 has a NACA wing profile, preferably a NACA 4415 wing profile,

with its concavity facing the surface of the portion 5a of the filtering panel that faces the suction port 8 of the extractor when each louver 10 is deemed to be substantially parallel to such surface.

[0043] Finally, also referring to Figure 7A, in order to avoid noise-inducing vibrations in the louvers 10, damping devices 10B are disposed on the louvers (or on the axis Y-Y about which the louvers 10 are pivotally mounted) to limit any vibration events.

[0044] Those skilled in the art will obviously appreciate that a number of changes and variants may be made to the filter hood of the invention as described hereinbefore to meet specific needs, without departure from the scope of the invention, as defined in the following claims.

Claims

1. A domestic hood (1) comprising a collecting section (3) with a filtering device (1A) inserted therein, the latter having a panel made of a filtering material (5) placed in a support frame (4), an intake duct (2) with an inlet located above said panel made of the filtering material (5), a gas extractor (6) located in said duct (2), **characterized in that** the suction port (8) of said gas extractor (6) only faces a first portion (5a) of said panel made of the filtering material (5), and a second portion (5b) of said panel made of filtering material (5) is reached by the suction of said gas extractor (6) through a channel arrangement (9), and **in that** it comprises a plurality of louvers (10) having a predetermined direction of extension and associated with said support fame (4) to overlap said first portion (5a) of the filtering panel (5), each louver of said plurality of louvers (10) being free to pivot about its own axis (Y-Y) relative to said support frame (4), as a result of the suction generated by said gas extractor (6), between a position in which it is substantially parallel to the surface of the first portion (5a) of the filtering panel (5) which faces the suction port (8) of the extractor (6) and a position in which it is transverse to said surface of the first portion (5a) of the filtering panel (5) such that its inclined position is a function of the amount of such suction.

2. A domestic hood as claimed in claim 1, wherein the extent (S) of each louver (10) in the direction transverse to the axis (Y-Y) is different from the extent of the adjacent louvers.

3. A domestic hood as claimed in claim 1 or 2, in which the extent (S) of the louvers in the direction transverse to the axis (Y-Y) has a value that increases from the pivoting louver located at the edge (5c) of the first portion (5a) of the filtering panel facing the suction port (8) of the extractor.

4. A domestic hood as claimed in claim 1, wherein said plurality of louvers (10) have similar extents (S) in the direction transverse to the axis (Y-Y).

5. A domestic hood as claimed in any of the preceding claims, wherein said each louver of said plurality of louvers (10) has a NACA wing profile, with its concavity facing the surface of the first portion (5a) of the filtering panel that faces the suction port (8) of the extractor (6) when each louver is deemed to be substantially parallel to said surface.

6. A domestic hood as claimed in any of the preceding claims, wherein said axis (Y-Y) about which each louver (10) pivots is located near one of the longitudinal edges of the louver, the other edge being spaced from the former to such an extent as to interfere with the adjacent louver.

7. A domestic hood as claimed in claim 1, wherein said support frame (4) is designed as a quadrangle, and comprises two parallel and opposed pairs of sides (4A, 4B), said plurality of louvers (10) extending across one pair of said sides.

8. A domestic hood as claimed in claim 1, wherein said plurality of louvers (10) in said position in which they are substantially parallel to the surface of the first portion (5a) of the filtering panel facing the suction port (8) of the extractor (6) cover from 30% to 75% of the area defined by said support frame (4).

9. A domestic hood as claimed in claim 1, wherein each louver of said plurality of louvers (10) comprises a pair of pivots (10A) placed at the ends on said main direction of extension, said pair of pivots being engaged with said support frame (4) and allowing each of said louvers to pivot relative to said support frame (4).

10. A domestic hood as claimed in claim 1, wherein said filtering panel comprises an activated carbon-based grid and/or panel, or a polyurethane filter.

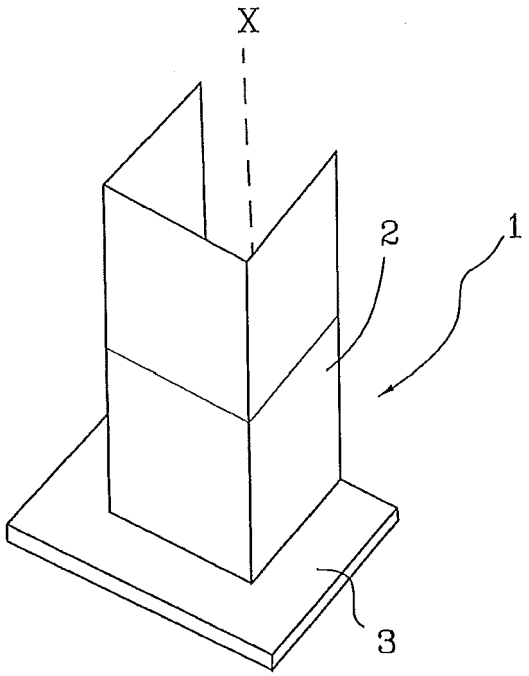

FIG 1

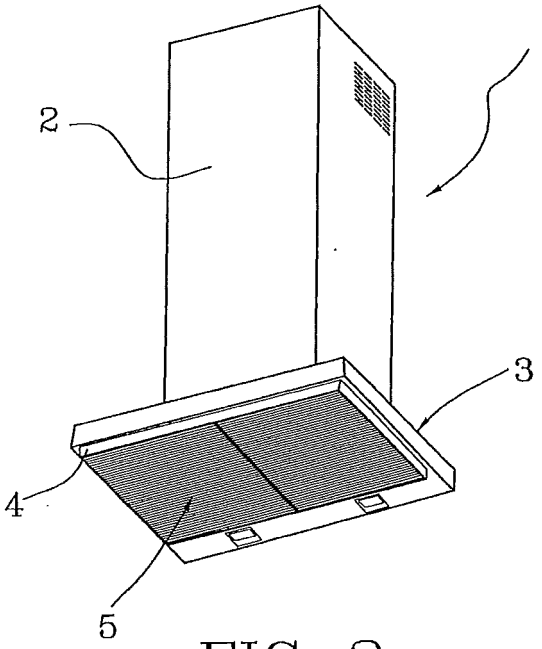

FIG 2

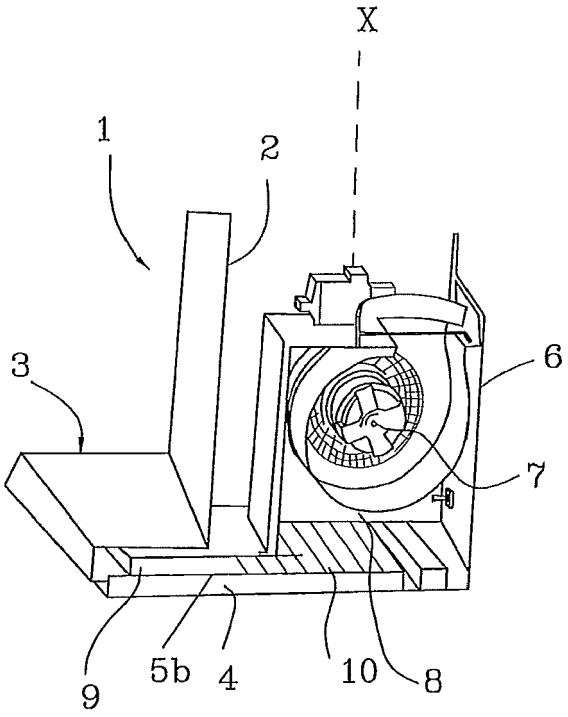

FIG 3

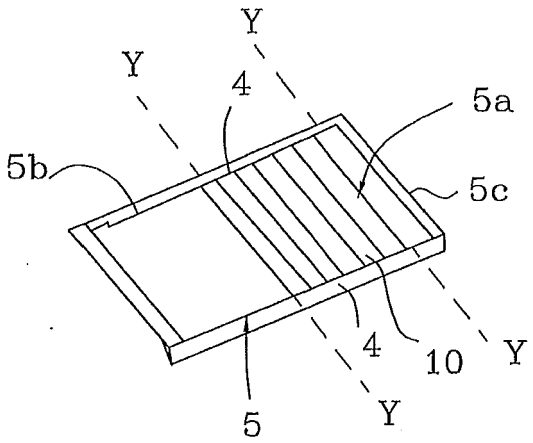

FIG 4

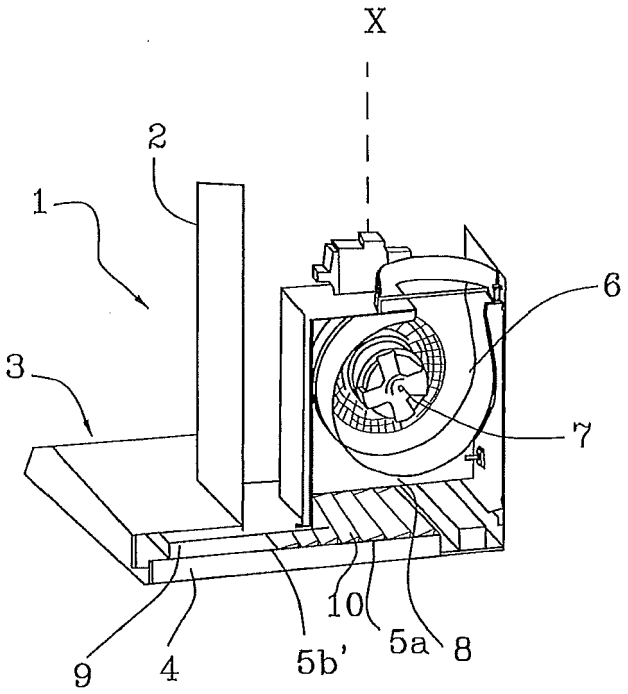

FIG 5

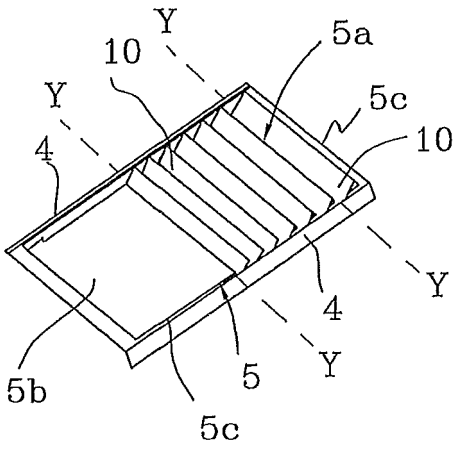

FIG 6

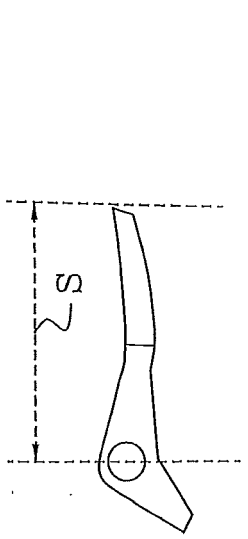

FIG 7B

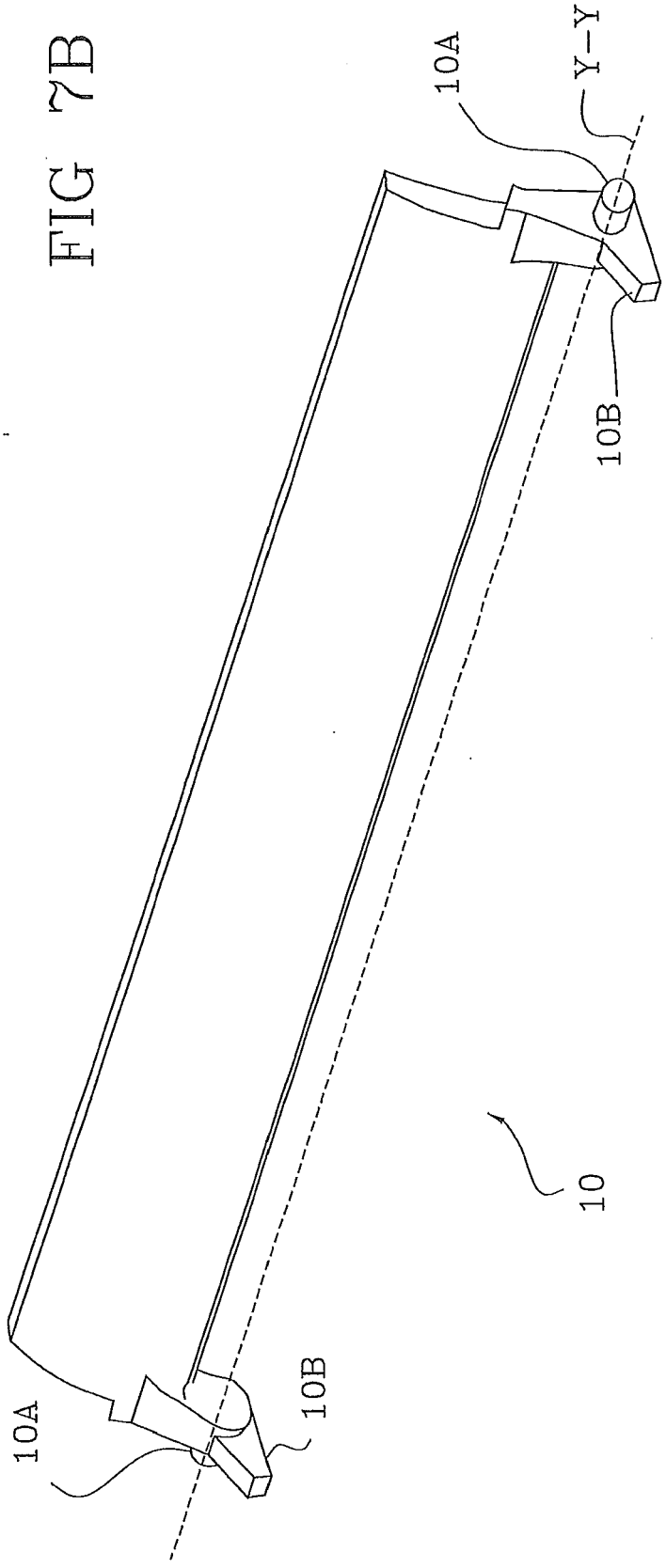

FIG 7A

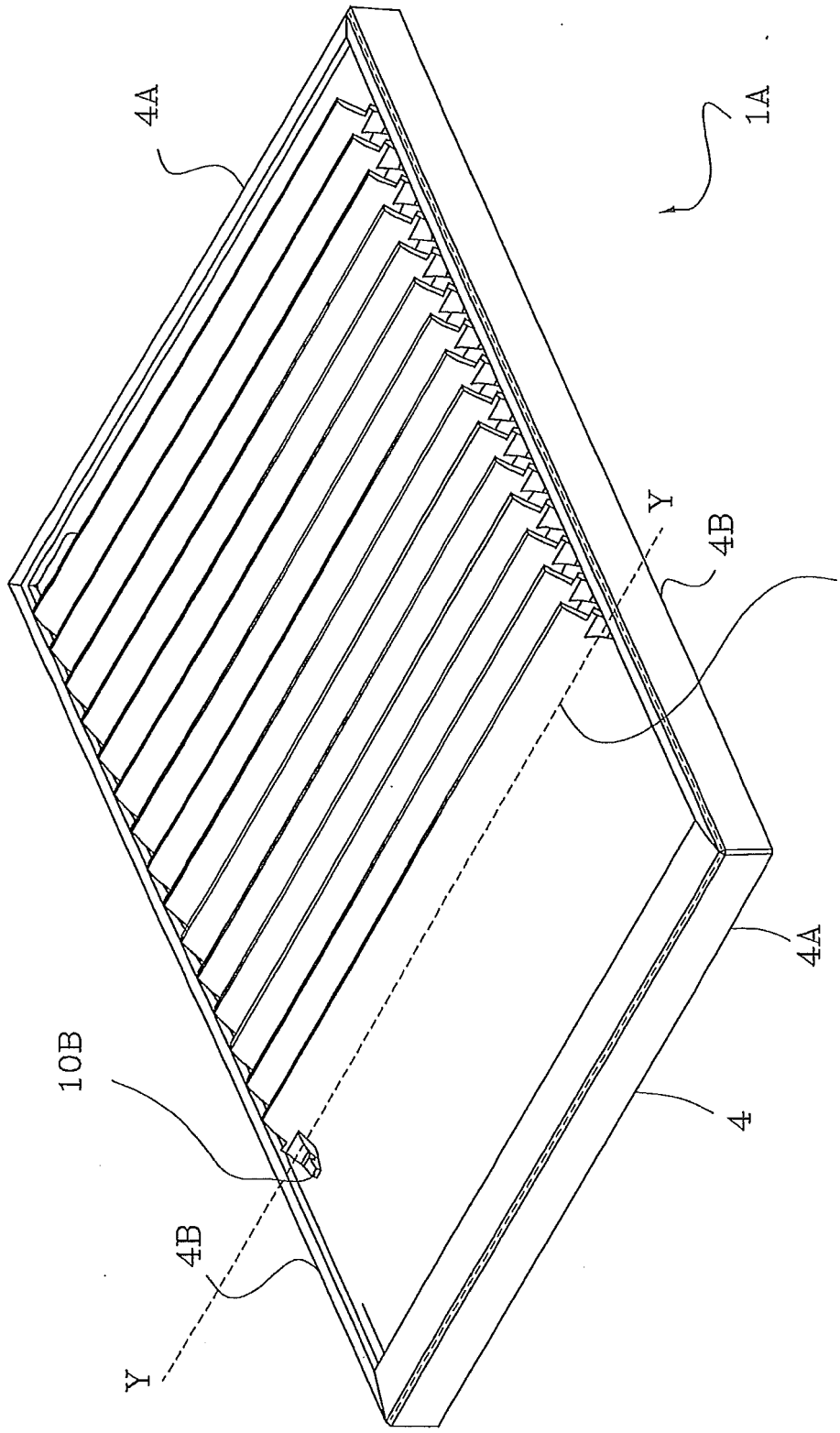

FIG 8

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EUROPEAN SEARCH REPORT

Application Number
EP 15 17 1111

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 August 2015	Fernandez Ambres, A

CATEGORY OF CITED DOCUMENTS

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